Question and Answer Summary: Sediment Removal Technologies

Peconic River Remedial Alternatives Workshop

IT Corporation

Question: In the Michigan site that you had to dewater, what was the level of the water table at that site relative to the proximity to the surface here in the Peconic?

Reply: Very similar. The water table in that area was a seasonal water body where you had a drop of probably three feet or four feet of water in the Michigan site actually. In that particular case, we dewatered the area; we still had some groundwater issues to deal with, but the removal of that sediment, then, is in an area where you don't have… where water is not being dispersed downstream. Water will be appearing in the hole in the immediate excavation, which means not having a downstream (covered by coughing). Some of the cases when you're dewatering areas or diverting water, you may use a porta-dam structure to divert water to one side of the stream. In the Peconic, maybe, down beside where you've got an area where you may just want to divide that area in half and only dewater half of it – half a portion of the Peconic, or an area of high quality wetland, you may try to divert water to one side, dry up one side, clean that up and then move to the other side. And that's a very common technique of splitting a water body in half, cleaning one side and then flipping over and cleaning the other, just dewatering it that way.

Question: How did you dewater that section? Was it just one of the examples you just gave?

Reply: Yes, in the Michigan site, it was just using standard pumping equipment and dewatering into a sedimentation basin and then letting it flow from there down and continue on its way.

Question: In addition to coordinating seasonally there, are there other things you've worked with coordinating like maybe when fishermen might be using the streams?

Reply: Absolutely. Seasonal considerations are a prime example of the work we do in eastern Pennsylvania – trout stock fisheries, in Pennsylvania there's a lot of money put into trout fishing so they don't… they make sure that excavation isn't occurring any time during trout season, so that's something you have to consider. Similar to a construction we're performing in Ohio right now, we can't do the construction until the spring because there's some bald eagle nests nearby, so they have some concerns about the noise issue. In eastern Pennsylvania, we're not allowed to work in the spring also because of bog turtle issues; we can only do the construction during the winter when the bog turtles are hibernating. So there's all these seasonal issues and timing issues which have to be wrapped back into your sensitive environments and your teeing(?) issues and many of the other public issues that are out there that you need to address. The Peconic River is

not a huge river so the time it should take to do some of these smaller sections, we can time that based on any seasonal concerns that you have.

Question: Do you notice any initial re-sediment or sediment release upon rehydration of a dried working…?

Reply: Well, there's two issues and two ways of doing it. First up, you can't just have a huge pulse of water come in, you need to make sure that water comes in, you need control by then, very controlled. Again, in a larger water body, if it's a lake, for example, you need to be able to just control it. In a wetland situation, one of the advantages is you can come in and hold that water for a little bit and try to establish a little bit of your vegetation, at least get some seed growth and a little bit of emergent vegetation to get that root structure to help hold that in place before you bring the water back in. It needs to be done very carefully.

Sevenson Environmental Services, Inc.

Question: You described two kinds of cases (remainder covered by coughing). Where do you dispose of the material that you've extracted and dewatered and so on? Where does it go?

Reply: Permitted facilities.

Question: In New York State?

Reply: In the case of Lake Champlain, it's near a state (garbled) St. Lawrence and into Canada. In the case of Chattanooga, Tennessee, it's going to… I'm not sure exactly where. Oh, it's going into Utah, to Envirocare of Utah.

Question (Jason Remien): It's obvious that you guys have a tremendous amount of experience with sediment removal and one of the… unfortunately, you weren't here yesterday, I showed several pictures of the river. You had a slide later on here with a swamp buggy. That one picture is probably the closest example to the situation we're dealing with here. So maybe if you can just spend 30 seconds to explain some of the other types of equipment you have and your approach to minimizing impacts to the wetlands with that type of equipment, because really we don't have any areas where you'd have a big, huge trench or a barge and you'd have a huge dredging operation. I agree with you that there's a lot of planning involved and once you set this out you have to dry it and whatnot, but specifically the areas that we're dealing with, they're very small, they're very swampy, they have wetlands, so if you can just spend a couple of minutes with some of the other equipment you have…

Reply: Miracle Battery is a good example of that and also we did a job in Alabama. Number one, you've already addressed the small boat. We have a small truck. But other than that point, we've fabricked out, geonet fabric and then matted and then built roads and used log-stick

excavators and excavated off of either side and loaded out, carried out, and when we got to the road build-out, then dug our way back out and then gathered that material up and took that out and loaded that out.

Reply: The equipment we have… we have traditional construction equipment – excavators, bulldozers, loaders, cranes…. What we try to do is we try… when we have unique projects in wetlands areas and environmentally sensitive areas, we custom fabricate our equipment to minimize any negative impact on the area but at the same time balance that out with maximum efficiency in the field. Because as a construction company, the work we do is generally for a fixed price, and to get that contract, you've got to be the low bidder, and to be the low bidder means you've got to get it right. But it's traditionally construction related equipment.

Question: I appreciate the scale, the magnitude of a lot of the projects. Mine is a little bit of a follow-up to what Jason was saying. This is an 8,000-yard job. It's four or five small, surgical excavation areas. Maybe in the wet, maybe in the dry, who knows? But any manner of removal of the sediment with this material… we had, yesterday, a lot of questions posed of the folks from alternative technologies – this is a mixed waste, it's rad, metals, PCBs. I know from my experience, we try to dewater this kind of material, it's tough to dewater, number one, and then the wastewater treatment side is number two. I know of no experience of anybody in the country with this mixture of materials and how to do the dewatering, how to do the wastewater treatment because just dewatering and discharging the water back into the receiving body – I can't be certain of it, but I can't imagine that's where we'll go.

Reply: You can't reach the treatment requirements?

Question: I would imagine that there's going to be a treatment requirement for it. I don't think you're going to be allowed to just discharge, so I'd like to have some, maybe give some answers.

Reply: I think you hit the nail on the head. As far as getting the material out of the area and separating solids from the water, that's not the difficult side of what you're pointing out. It's treating what a lot of people think is the byproduct, but I believe the water is the product and solid is the byproduct because the water, if you don't do it correctly, it's going to shut you down. (Two people talking over each other.) If you have a difficult time with the solids, you react to that, you can inventory that, you can hold that until you can resolve and move forward. But the water is a continuous thing, and you have one problem, and the water shuts off, the whole system shuts off back to it. So, (garbled) got pretty good sampling, lab analysis, which we have our own lab and we do what we believe… our methodology by extracting the solids from the water and then developing the water treatment process around the fact that there's heavy metals and there's PCBs and others. And what various treating and/or filtering processes are we going to go through to arrive or meet the criteria based on how many total gallons that we're going to have to do so what does the system have to do and what does the life of the system have to be to sustain the total lapsed time of the solids removal program. Did that answer your question?

Comment: That's okay. I raised my point; I think the point was taken.

Reply: All the point is is that we're… I don't know the specific statement of work that has to be done in the Peconic River. If it's surgical removal of a small volume of material, that's fine. We do that. You size your construction operation to what your problem is (muffled). All I can speak to you from is the construction contractor's perspective. How do you identify the… how do you define the statement of work, how do you put together a set of documents that a contractor can take, digest, understand, and execute in the field that's going to comply as close to your set of objectives as possible. Sevenson does small work; Sevenson does large work. Unfortunately, the slides we brought and the jobs we talked about today weren't a complete match to what your situation is in the Peconic.

Comment (John Paulie, of Roy F. Weston): I think you bring up a good point about the way the project ultimately will be implemented from a contractual standpoint. Knowing the Peconic River project, let's call it a small surgical, possibly surgical removal of certain areas, and from your standpoint, based on your experience contractually, what would you see as maybe being a successful way to contractually implement this? For example, design build through a construction based on the contract document? I'd be interested in your response.

Reply: What we find is these are complicated jobs from a… politically, emotionally, from a community perspective, there tends to be a lot of scrutiny (garbled). It's a recreational use (garbled). From our experience, from our perspective, the removal can be engineered, it can be analyzed, it can be designed, it can be executed, it can be restored. The question, the real question is how you are going to contract the work to guarantee that the job meets 100 percent of your objectives. How do we do that? There's a lot of ways you can creatively contract. You've got the Corps of Engineers, I don't know if Brookhaven is working with the Army Corps of Engineers in this region. They've got tremendous experience on remediating rivers and sediment work from small streams up to major waterways. So I don't know what your pool of talent is to come together with a real effective team approach and get this thing done. The only thing I would suggest from an experience perspective is: the more talent you pull together, the more discussions can arise, the more solution-oriented ideas can be generated, the more… pitfalls, how you can avoid pitfalls. Once you mobilize equipment and manpower, the contractor's objective is to get that thing done and get it done as quickly as possible and as efficiently as possible. If they run into pitfalls where there's, and this becomes a real critical issue, if the contractor has been brought in early enough to help with that process of identifying the real areas of concern, he goes out to the job site, he encounters that area of concern that hasn't been addressed previously, well, then you've got yourself a problem that needs to be addressed.

Barry Lawson: I'm going to have to intercede here. I know there's a couple more questions, but I'm going to ask you to save them until the panel discussion and move on. We're running a little late, I want to make sure I get these other folks.

Miller Environmental Group, Inc.

Question: You frequently refer to "staged" pumping but you did not give us your definition of "staged" pumping.

Reply: OK, I apologize for that. Staged pumping would be where we would utilize a pump system where you're possibly running these pumps out. It's a trailer mounted pump. You can hook it to an ATV for whatever reason, get it out to the area where you're going to pump and then, based on what your pulling and the amount of the volume that you're trying to pull out of an area, you can actually set up a pump, and based on the distance that you need to pull, another pump to get to a guzzler box or a sludge box so that you can come by with a roll-off truck, pick that box up and take it to wherever your disposal site will be. So it's another option in the sediment removal in that you can set up a staged pumping system to get out to the areas where you have limited access, where you're not going to build a road in and, you know, bring back out, you put a staged pumping system in to get the product out to a certain point where you can set up a staging area that you're not causing much damage.

Question: What's the ratio of water to solids in your operating?

Reply: It absolutely helps to have some makeup water in there to recover product. Specific ratios, it depends on the material that you're picking up. In our approach, we would have to have labor in the river itself to make material available to the hose. The hose, if it sits in the water and it's unattended, then you're going to recover a lot of water. You're going to dig out a hole around the end of the pipe and you're going to start to draw the water into that area and you'll get the groundwater coming in. So, you want to make sure you're moving the hose around. The more you have the labor on the end of the hose moving to the surgical points; say if we have an area caution taped off that we know is the contaminated area, well certainly in that area we would have a guy in chest waders that is moving the hose around to recover the ten inches, or six inches of sediment.

Question: What would be the best ratio in terms of water to product?

Reply: The guzzler vacuum technology can be used in either wetland or dry land so if it's chosen that they go divert the river to dry recovery then we'll have to use dry piles. The wet concept would be what comes out at the end of the hose. Vacuum technology can be used in both. What you are probably concerned with, dredging where you would have to treat it or if it's redirecting the water… (very muffled & noisy). Part of the river will probably be fairly dry… (muffled and noisy). How effective is the guzzler truck… (muffled) stay on top of it, because I think some of the areas will be just that, they'll be mucky areas with no… (talked over by next speaker).

Reply: At that point in time, if we get to that approach, we'll have a detailed plan where it says this is how that material will be made available to the guzzler, meaning hand digging or possibly a rubber track vehicle in there to actually pick up the material, turn it over so that the guzzler can

pick it up. If you have rooted material there, certainly it's going to be very difficult to pick up rooted material, but the material that it can pick up, it does have dry and wet capabilities so it can pick up the material, it just has to be made available to the hose there either by mechanical labor and personnel to bring the material to the end of the hose.

Question: Can you break up rooted material after it's been (muffled)?

Reply: Yes.

Question: It seems like with the seasonal approach issues, whereas other technologies favor when the sediments are drier, yours, you'd probably want a certain amount of moisture content?

Reply: No, that's not necessarily true. There will be cases where, I believe in some of the (muffled) so far, it sounds like there's a bit of groundwater percolation back up, feeding the river system. So, I think that you're going to be dealing with (muffled by coughing), if you're in the riverbed. However, if it's dry conditions, we just have to make the dry material available to the end of the hose. If it's a wet condition, we just have to agitate the material to the hose to pick it up.

Question/comment: Conversely, if there's some reason why it's beneficial to do it when there's water there, then maybe that would be a considering thing for this technology, a consideration.

Maxymillian Technologies, Inc.

Question: On your NTU numbers, they're impressive…(muffled). After you remove the cofferdams, though, have you done any post-project turbidity monitoring, to see, with the idea that you can't remove every bit of organic material, there still may be some in the restored area that may be resuspended after you allow water to flow back over the area? Have you done any (muffled) turbidity work after that?

Reply: Yeah. To start to answer that question, on the turbidity itself, each project is different. But, for example, the (garbled – River Saki?) project, we were required to go up there and take NTU readings, I think it was 30 days before we started any work and we're still finishing up there, but I think there's a 60-day tail after the project where we have to go up there and take, I think it's daily for the first couple of weeks and then weekly after that for a while, and continue to monitor that to see if we've disturbed any areas. And I should also say that turbidity curtain and some of the barrier controls will remain in place for a while with the idea of making sure that we didn't disturb something and leave it so that (garbled) the turbidity in terms of contamination, in a lot of these projects – for example, in (garbled, River Saki?), the excavation area was predetermined and prenegotiated between the client and the DEP of New Hampshire, so they weren't taking excavation area samples, they had already negotiated cut lines, and that was why we used GPS up there, because we needed to excavate exactly to the cut lines within the river. In

the case of the Housatonic River, (muffled). When we excavate, we keep the dewatered area dewatered, they take cut samples or excavation area samples and see if we need to go after more. In fact, in that area, in many instances I think one of the reasons why the sheeted cofferdams were useful there is because in many cases when the original cut was expected to be one or two feet of sediment, we were going down five or six feet, so you needed that kind of support there so that you had the capacity to go to the initial depth.

Question: What kind of rate was that in the sandbar, when you have cofferdams set up and you're working dry?

Reply: We had pumping set up, for example in the Housatonic, that was capable of 1,000 and with supplemental equipment, able to make 2,000 gallon a minute bypass pumping if necessary. Typical pumping rates were below 300 gallons a minute. So, I don't know the exact (muffled by coughing), I don't know whether it was a 30-year storm event or a 100-year storm event, but that's basically the approach.

Question: How do you handle fish and wildlife as you're constructing among the wetlands, trying to minimize (muffled)?

Reply: Well, in the case of the embayment(?) that we do, for example the embayment that we did in southern Illinois, before we were able to do that, the client basically hired biologists to help us locate where was the best spot, because the concern about the embayment – I didn't show you how the embayment was done, because (muffled). Now, I will tell you that we didn't strain any fish, and there was definitely a lot of fish left high and dry, but they hired biologists to try to determine the least impacted area where we could put the access road.

Panel Discussion on Sediment Removal Technologies

Question: Actually I had some interest in the Thorium project that was done in Chattanooga and maybe building on a question that came up earlier about the water treatment. When that was being de-watered, did you have to deal with rad treatment issues of the water or was the thorium pretty much contained in the solids phase?

Reply: Water treatment was a big issue.

Question: For radionuclides?

Reply: Yes.

Question: And in that, presuming that you did some type of separation maybe to determine for disposal purposes, was that, I presume some type of scanning maybe, gamma scanning or something and what was the effect, how critical was the water content on the success of separating your rad vs. non rad materials?

Reply: Performance base specification negotiated collectively between the State of Tennessee, the owner, the design engineer, and the (?) involved. So, Sevenson is required to meet the objectives. I can't tell you what those objectives are. It was a closed system in terms of meeting… specific treatment standards had to be met. (Garbled.)

Question: That was a successful project as far as the rad separation …

Reply: I think the highest number I remember is 38,000 picocuries was at the high end. I don't know what the average was. The treatment standard was a very stringent standard.

Question: (Sven Hoeger) Just a very practical question. Again, in terms of any method whatever it is where you actually excavate material you would then need a staging area where you would deposit this material, add water, separate, whatever you're doing. This size, for this type of project that is contemplated here, what kind of size requirement is there and how close does it have to be to the excavation site?

Reply: How close?

Question: Yeah, the staging area. How close does it have to be?

Reply: If you did it in the dry obviously then you would transport it by truck. You'd have to line the truck and cover the truck. You would have to have them go along with DOT regulations.

Question: Just take it right off the site. Is that what you are saying?

Reply: You may very well take it off site, take it to another site. The other site would be prepared to hold it in inventory for subsequent disposal. Hydraulically dredged, you would pipe it and if it was for a significant distance, you would maybe (garbled). You would have to boost it, go all the way, and you would have to levee and/or dual contain that line.

Reply: In the ideal situation, that staging area would be identified either up front in the bid document, or in conjunction with, on a collaborative basis with the stakeholders.

Question: Before you even get into that, you really want to come up with a disposal plan of what material you're pulling out of the river and identifying those contaminants and then how… are you going to process it after you pull those contaminants out? Are you going to try to precipitate the metals out, separate the radionuclides? And then where are your disposal facilities? Do you have a method? Because once you start handling it as a liquid/solid separation, you may get into a situation where you want to solidify because your solids price is less than your liquid price. So that's really a project that, in its own, that you have to determine, before you even get started, how you want to dispose of this material. How do you do that? You have to look at your information, your data collection, and say, "Here's what we have for a remediation product or byproduct that we're going to pull out of the river, and then once you establish what those contaminants are, work with the regulatory authorities as well as the contractor that's going to work with your disposal to determine what's the best method, cost-effectively and efficiently, so you're not handling

it five times down the road. You want to try to handle it one or two times at maximum and get it to its disposal site. So your staging area is really going to be dictated by your overall plan of how you want to handle your waste. If you want to handle it a couple of times, sure you're going to put it in a staging area, then come and get it with another truck and take it to your disposal facility.

Barry Lawson: Okay, a response and then a question over here.

Reply: Yeah, I think a lot of it also depends on doing your best to minimize the amount of water that you accumulate in the first place. At the excavation point, if you're not specifically excavating in the dry because you've bypassed it in some way, you have high and dry areas, then the more you can do to pull material out of the ground that's as dry as possible, the less water, subsequently, I think, the smaller a staging area you're going to have. Just as a very general reference point, we used something on the order of a 100 by 150 foot sprung structure to pass 12 to 15,000 tons of sediment through in the course of two and a half months. That was sufficient room to dewater a sufficient (garbled) and load it for transport. Now, that's not going to happen (covered by coughing) you've got four or five different areas, so I suspect you're going to do some initial passive-type dewatering at the excavation point if you're allowed to by the DEC, and then you'll have some centralized staging area where you prepare for off-site disposal.

Question (Skip Medeiros): The question was specifically about drying beds. Can you speak a little more about the requirements for drying beds and the tradeoffs?

Reply: The tradeoff is cost. You can do a lot of things actively. You can use filter presses, you can use centrifuge, you can use a lot of things to actively dewater, and your advantage there is that you can achieve a dryer material faster. You might also have to do that in the case where you have materials that don't dewater very well. I don't know enough about the geophysical properties of your sediments, whether they're silty or sandy or clay. You have at least some sand. So, I think with your material you're probably going to dewater some of it well using gravity methods or staging methods and will not necessarily require pressing or things like that.

Question: Can you tell us how much space we'd need?

Reply: Well, again, I was taking a rough shot. Say 10,000, maybe 12,000 tons of material? I'd think a centralized facility on the order of 150 by 150 or 200 by 200 [feet] would be a sufficient staging area to have a dewatering operation and a storage operation. It's sort of hard to look at just one segment of the project by itself. You need to have, already in place, a good program for where it's going off site. The whole project needs to be integrated into one cohesive process. That type of size requirement for dewatering depends on having a ready and available program for disposal so you're moving material off site. You're going to accumulate material because there's going to be some, for example, batching and testing of it to determine where it goes, then you need a bigger area.

Question: Question about limiting the volume of material produced. We've got five different areas, each of them quite different, and a lot of shallow deposition. So, using traditional construction techniques, you have the potential to balloon over the estimated

8,000 [cubic] yards. What approaches do you have available to minimize that, and how important is characterization data associated with that?

Barry Lawson: Are you asking anyone in particular?

Question: No, I'd like to hear what can be done from…

Reply: I think a lot of that's going to be controlled by a good survey on-site control (garbled). You have good, solid data that's telling you what your limits are. You're going to be excavating with smaller equipment because we know the Peconic's a smaller area. You're not going to go out and do a massive excavation; you'll do a smaller excavation and just have good survey control as you're doing that. That's really the key. That way, you do not over-excavate.

Reply: I get a lot of these questions, basically, around the engineering design. You're going to come out and you're going to say, "Hey, this is the limits of contamination." So the contractor just doesn't come in and dig to that particular (garbled) depth from preconstruction sampling. Then it'll go to confirmatory sampling and that will determine if the contaminants have been removed at that particular elevation. If it hasn't, then it's going to be dig deep. I think one of these fellows made a point that the original design was one to two feet, in some cases they went four or five. And we've experienced the same thing.

Question: If you're working in a dry environment, what's the practical limits of excavation? Can you take six-inch lifts, or what kind of lifts is it practical to work with?

Reply: From a field standpoint, I think the client always wants you to work in six inches. However, that has a lot to do with the (garbled) on the project, for digging an area, waiting for confirmation, and coming back into an area in the event that that wasn't adequate. And you go in and you get six, and then you go in and you get six, and then you go in and you get six, and that gets expensive to redig and redig and redig. And also it affects the logistics of the project from getting the material out of the way. So, there again, from an engineering design and specification standpoint, right up front, once you know the limits of contamination, I would say foot increments. You can go with the capacity of the equipment.

Reply: I think part of the issue there is determining whether or not you can predetermine your excavation cut depth or not. We've had some instances where that's been negotiated and that line is the line, there is no confirmatory sampling. Then other instances that we were just talking about where it's kind of dig-and-check, dig-and-check, to check your progress, and it's a cost tradeoff. You can spend more money on your upfront characterization and design a very detailed 3-D grid of exactly what you're wanting out there and that would be it, or you can be less detailed in your characterization but then you're going to dig and dig and confirmatory sample.

Reply: (garbled) the turnaround time for that sampling. If it can be done on site, it's obviously to the benefit of the client as well as the contractor. It all comes down to money.

Question (Dr. Meagher): I have sort of a hypothetical, to figure out how our technology might work, how phytoremediation technology might work given this. If you were to take sites that you have experience with and separate out things that are just contaminated with toxic organics from those that are contaminated with metals and radionuclides, not worrying about the depth issue, let's say we can phytoremediate all those that are just purely organics, that aren't contaminated jointly with metals or along with metals, what percent would be purely organic contamination? What percent of the material you guys dispose of would be purely organic versus jointly contaminated with metals or all metals?

Reply: Just addressing our own experience, I would say 80 percent, maybe even higher (covered by coughing).

Question (Skip Medeiros): Neil, is that based on sediments that have a mixture of both organic and inorganic contaminants, or are those just sediments that you were called in to clean up organics?

Reply: The latter. In a lot of cases, there are ancillary contamination issues. For example, MGP manufacturing gas plant sites, the primary contaminants are organics, semi-volatile organics, but there frequently are ancillary metals contamination issues as well. So, you're checking for them and they might kick you into a different disposal category, but the remedial goals of the project are usually built on the organic.

Question: The coupling of GPS with dredging has made a huge difference in terms of precision and knowing your position. I'm just curious, following up on the prior questions, in some remediation work, (garbled) active sampling of carbon and other contaminants has been used to directly orient further excavation. We might expect contaminants to be associated with a flat optimum particle size of around 63 microns. I'm wondering if you have any experience or ideas on how these kinds of surgical technologies might be incorporated into the work on site here?

Reply: I'm not sure I heard the whole question; it was kind of rambling at times.

Question: The size of the particles where contaminants tend to associate looks like it's around 63 microns or thereabouts. If you were able to, while you're excavating, identify particle size and actually drive your construction removal based on on-site evidence, you could be much more efficient at the kind of job you need to get done.

Reply: The process can be very specific or it can be (?). It depends on how you define the statement of work. If you want to spend a lot of money up front, pay for a complete characterization, really understanding the treatment technologies available and the removal technologies available, that's really a decision that you can (?) up front with the stakeholders, and I'll tell you, contractors can't help you work through that process. So it's just a matter of inviting the contractor or contractors in and having a roundtable discussion. But the bulk of your money will be spent in the remediation phase, the tail end of it. And the question is, how do you define that and how do you set up the statement of work and the contract to execute the statement

of work to meet the financial goals and objectives as well as the treatment goals and objectives of the project?

Reply: I think you were asking if there's a correlation between the contaminants and grain size in your particular case. Could we use grain size analysis as opposed to chemical analysis to identify places to dig versus not dig?

Question: It could be grain size, it could be whatever is directed if you're going to look at carbon or something that comes out of the sediments you're getting out of there.

Reply: I guess the answer is, yes, that's doable. I'm not sure whether or not the DEC would buy that as your measurement. Assuming that they do, the answer would be yes, it's feasible. I'm not sure if you're giving yourself any more rapid response time than you would from doing a field screening chemical analysis.

Reply: The bottom line is to have a good delineation of your contaminants whether it's done through chemical analysis or grain size analysis.

Reply: The only way you're going to minimize the amount of waste coming away from the project and really best delineate what's going to be removed is to have good sampling analysis up front and then the difference between having a lot of waste coming away from the project and minimizing that waste is going to be having areas set up very specifically with perimeter sampling and that's the correct approach, and then you have the approach where you say, "Clean this 100 feet of river," where you're going to get gross removal.

Question: In deference to the conversations that happened yesterday, try to make this an equal playing field of comparing alternative technologies versus what's in the ROD right now of further excavation. It is surgical removal, it's eight to ten thousand cubic yards, it is 45 to 65 micron-type particle size. Dewatering mechanically, I believe, is going to be necessary. I don't know how you gravitationally dewater 65-micron soils. You've got mixed organics, low-end concentration PCBs, DDT, you've got rad and low picoCurie discharge requirements. I see the feasibility study that was developed at about a $6 million price as taking some fairly idealistic and hopeful assumptions as to some of the cost components that are in the job. So, we were asked yesterday on some of the alternatives, I believe, on the side, to try to figure out how we're going to compare against the $6 million conventional hog-and-haul technology. I think some of the bases that are in the feasibility study might be on the optimistic side. So I'd like you to perhaps address some of the issues that were in the feasibility study as they affect this project and see where you think some of the assumptions may have been a little bit on the idealistic side.

Reply: I'm not familiar with the FS.

Reply: I'm not sure if any of us have seen it. I haven't. I can't address the specific issues, but the things that you just mentioned there, each of those facets are doable. I couldn't begin to tell you what my cost estimate for the project would be based on my limited knowledge.

Barry Lawson: It's a very fair question.

Reply: You could certainly dewater this material. I'm sure each of us has had experience dewatering the siltiest, pure clay material and, yes, there's a lot of different ways that you can go about that, and mechanical means are sometimes necessary. You can certainly treat the water byproduct. I'm not here to tell you that it's easy. I think one of the keys is to minimize the amount of water that you're treating. The contaminations are low-level and they're mixed. I'm not here to try to negotiate with DEC or you, but I think that certainly the low contamination levels make this a better candidate than high contamination level projects for leave-in-place or using some passive in-place or in-situ methods than excavation. It's not a hot spot that absolutely has to get out of the ground. But in terms of the physical methods that are being discussed, each of those is feasible. Whether it's more cost effective or not needs a lot more analysis.

Question: What information do you need to determine whether hydraulic dredging is applicable?

Reply: Hydraulic dredging?

Question: That's right.

Reply: We need to take a look at the FS and any preliminary engineering reports that have been generated thus far. And it could be as simple as visiting the site, getting the site log. But the gist of what I've picked up on over the last couple of hours is that this doesn't seem to be a dredging operation. It's a surgical removal job. And that seems to be the most cost effective. Hydraulic dredging is expensive work. It doesn't mean you can't do it, it just means the economics for 10,000 [cubic] yards isn't going to be there. It sounds like you've got a surgical, just looking up and down seeing what you've got here, it sounds like it's a surgical removal of a hot spot.

Reply: We can take a look at it and determine a route from one area to the other and set up each area (garbled), but from what I'm hearing, it doesn't sound…

Reply: Hydraulic dredging is typically more used in large, open water projects… (remainder is garbled).

Question (Skip Medeiros): A follow-up on the various dredging technologies. There is a section, the upstream section, Area A, which, relative to the rest, Areas B, C, D and E, is probably the best candidate for hydraulic dredging. It's also the area that's most accessible. Areas B, C, D and E are largely vegetated, except for the actual course of the river. That makes it perhaps necessary, if hydraulic dredging were an option, that there be some excavation to free the rooted material. Just, for the record, they're both potential options.

Reply: That area is relatively small.

Comment (Medeiros): Very small. A hundred yards by ten to fifteen yards.

Reply: Did you say 100 yards long by ten to fifteen yards wide? About 15,000 square feet.

Reply: You could reach in there mechanically.

Reply: And how far does that extend into the river?

[Some discussion. They put up an overhead showing a map of the river and discussed the approximate size of Area A. Jason Remien showed some overheads from his presentation of the previous day (Dec. 12, 2000), illustrating the appearance of Areas A, B and C.]

End of panel discussion